INDUSTRIAL ARCHITECTURE OF THE URALS: SEVERSKY TUBE WORKS

Kochkina A., Ural Federal University,
Research supervisor Prof. Kelchevskaya N., Doctor of Economics

Industrial architecture is a significant cultural and historical phenomenon, which is reflecting not only the functionality of the plants and factories, but also the level of development of countries and regions, scientific achievements and technological progress, cultural characteristics and human values.

In the Urals industrial architecture arose simultaneously with the Russian colonization of the region in the structure of the salt towns. [1] With the development of metallurgical production the Urals became a reference edge of the national industrial architecture in XVIII – first half of XIX century. The architects of the first Ural factories were the so-called dam master, who solved the problem of creating water pressure for the water acting production technology and metal processing. Hydraulic systems of the Ural factories of the XVIII century were not only the most powerful and advanced for its time, but also determined to the city-forming basis of the first industrial settlements. This period is important due to the formation of the principles of industrial urban development, since most of the Ural factories had been the basis of the first industrial cities. The plant was the central core of the settlement, the square in front of the plant was administrative and commercial centers linking the plant to residential areas. [2]

One of the oldest Russian metallurgical plants in the Urals is Seversky Tube Works located in Polevskoy town 40 km away from Yekaterinburg (Sverdlovsk region). Seversky plant is not only the one of the flagships of the Ural metallurgy, but also the support of cultural and historical heritage. The factory managed to keep its original form of one of the two blast buildings of the XIX century including the very blast furnace and other industrial equipment, as well as the casting yard and some other surrounding historical shops. «Severskaya Domna» commonly referred to this preserved historical industrial complex is an object of cultural heritage of federal importance and a recognized masterpiece of industrial architecture of the Urals. Now the old blast furnace operates successfully as a factory museum. [3]

State Seversky plant was built in 1735-39, in the vicinity of the plant Polevskoy which was founded a few years earlier. The very first building of the plant – bloomery shop – was made of wood. [5] The plant originally specialized in "redistribution" of Polevskoy iron. On December 31, 1751 the stone-cutting factory was constructed. Marble, which was treated there, went to St. Petersburg for decoration of palaces and squares. In 1756, the plant was transferred into the possession of the successful Ural industrialist

A. Turchaninov. Subsequently, the plant belonged to Solomirskih family (Turchaninov's heirs) and in 1912 it was sold to the British public limited company "Lena Goldfields Limited". The plant was in possession of the company, until it was nationalized. For 5 years of owning the plant, the company has carried out its extensive modernization. [4]

New bloomery shop of Seversky plant was built in 1842 on the site of the old wooden workshop. Its walls were made of red bricks of high quality, and the overlap was made of metal (forged iron lane), typical Urals construction farms with arched lower and upper triangular belt. The lantern is designed on the ridge of the roof. Elegance of a design in an interior was defined by a tracery of the whole structure, and the form of arch space of the shop. Now the shop is reconstructed with preservation of all advantages of architectural concept. [5]

The architectural and planning structure of the Seversky plant was changed in 1860, when two new blast furnaces were constructed there. Blast Corps were made in the style of late classicism. Blast furnaces were placed in separate brick buildings and were connected by the common casting yard. The buildings were located in 10 meters from the almost vertical slope of a dam. Loadings of the blast-furnace were carried out from a dam on the animal-drawn bridge. [5] Blast-furnace cases belonged to the so-called "closed" type when all blast furnaces consisted of the integral construction room which form was approached to the form of the furnace. The body of the blast furnace was laid out from bricks and pulled together with metal hoops. On one side turned to the dam, there was an aperture for accession of the animal-drawn bridge. The bridge is lost now. The composition of two identical cases was under construction by the principle "octagon on the quadrangle". It was functional for the blast furnace shop, because in the corners of the quadrangle there were pipes on which blast-furnace gas went outside. In the tetrahedral capacity two-colored octagonal drum was installed, completed with a narrow three-part entablature architrave in the form of shelves, smooth friezes and cornices. Semicircular dome was set in the octahedral volume. Octagon metal domes were crowned with graceful lamps serving boot area.

At first, the volume of the working space of each blast furnace was 55 cbm. However, in 1897 the blast furnace № 1 was reconstructed, and its capacity increased to 82 cbm. Blast furnaces, built in 1887, were more powerful and had great height, what made the builders to construct on the old blast-furnace case. Each furnace had three heaters for heating the blast in the shop. They were located on the west side of the building. In the early 1930s, all the heaters, together with the furnace № 2, were dismantled. [3]

In 1897 in front of the domain housing, in line with the foundry yard, the workers from Seversky and Sysert' constructed by their own efforts the body of the pressure-blowing high power machine (instead of water machine). But because of economic reasons it was used only when the plant's pond hadn't

enough water. The facade of this office had one entrance and one window, similar to the front of the cast house. The blower, established in 1898, still exists today. The entire complex is made of red bricks. All the window frames are cast iron frames. The steam blower is still preserved. The cast house floor was made of iron plates. It settled iron molds (forms).

Near the casting platform there was a filling foundry, in which molds for large castings were produced. On the foundry yard there were some manual cranes, one of which – 6-ton, verbal type – was made according to old drawings anew and exists until now, as an exhibit. The interior of the foundry case is formed by a combination of arch apertures as within the walls of blast-furnace cases, window and openwork metal "network" of overlap pings. Arch apertures of entrance gate and windows define also the composition of facades of a complex. The eaves of all cases are emphasized with a "gear" brick belt. On a longitudinal facade of the foundry yard there were three entrances for cartage with two windows between them. [5]

The ore yard served as the second floor. In the courtyard there were three ore crushers for crushing large pieces of ore and limestone, burnt ore was unloaded from the furnaces. Near the ore yard, in the annex, there was a steam engine for crushers and the lift.

The third floor was placed over the ore yard, at the level of the loading platform of blast furnaces. Here, on platforms, charcoal and crude ore were brought for their loading in heating furnaces. Here (i.e. from first "floor") the vertical elevator of a trolley rose from the ore yard by the third, with ore and limestone, prepared for melting.

In 1914 the furnace № 2 was stopped because of exhaustion of forest stocks and insufficient providing two furnaces with ore. In 1930-1932 it was sorted. In 1921 also the furnace № 1 was stopped. During its idle time the forge part of the furnace was capitally repaired and for the first time water cooling of a horn was executed.

In July 1934 the blast furnace № 1 was forever suspended because of the lack of mechanization of heavy work, which reduced productivity (output) of the furnace: smelting per worker-blast furnace at Seversky was 40: 160 = 0, 25 tons. That is 3 times less than in Nizhny Tagil, where each blast furnace gave to 1,000 tons of iron or more per day.

But the furnace № 1, which is now called "Severskaya Domna", exists today. The preserved blast furnace is a unique structure. It is the only sample of the furnace of the end of XIX century, preserved in the Urals. Especially valuable is that now preserved blast-furnace building with the oven, built in 1860 and remodeled in 1887. It shows the phase of the reconstruction of blast furnace production and competent, considerate attitude to the original architectural design. The monument is valuable by the fact that all chain of a metallurgical cycle and also faultless architectural concept have remained.

In 1970 the blast furnace became a branch of the factory's technological museum located in the building of the former Sacred Trinity Church. After considerable repair the ancient industrial hub was called "As the museum complex "Severskaya Domna". The ensemble of buildings of the Seversk domain production was taken under protection of the state by the Resolution of Council of ministers of RSFSR of December 4, 1974, as a monument of industrial architecture of republican value. On the basis of the decision of regional executive committee of November 25, 1988 for No. 446, the item 3 "About Measures for Improvement of Protection, Restoration and Use of Historical and Cultural Monuments", the ensemble by means of scientists from the Ural architectural institute it was subject to partial restoration. [3] Now the museum has a large number of exhibits – large-size (the engine with the car on rails, the truck of military years, a fair cage of the rolling mill with a bed, a martin ladle, molds and so forth), established on the former ore yard. The Seversk blast furnace can be seen in Yaropolk Lapshin's movie of "Demidovy" (1983) – a few scenes of the film were shot there.

There is one more monument of architecture on the territory of the plant – Spaso-Preobrazhensky chapel which is completely made of iron and was the exact copy of a chapel of the XIX century (Preobrazhenskiy chapel of 1883). It was established in 2013 on the top platform of a museum complex.

The memorial museum "Severskaya Domna" is the historic center of a large modern plant – JSC "Seversky Tube Works" (since 2001 entered into Pipe Metallurgical Co.). The plant is the modern enterprise which is letting out the steel pipes conforming to the domestic and international standards and requirements. The structure of the plant includes the main production facilities: drop-hammer plant; the electro steel-smelting; pipe-rolling; electric-welded pipe; auxiliary workshops and production.

Thus the architecture of plant answers the basic principles of corporate environmental policy. As the part of the production modernization there were built modern gas cleaning and continuous flow water treatment facilities; 2 reverse cycles; the station of aeration and biological cleaning was reconstructed, the aeration tank was repaired.

The silver heron (Turchaninov' symbol) which figures and now decorates the Seversky plant became a distinctive sign of the plant.

In 2014, Seversky Tube Works celebrated its 275 anniversary. The monument to Working mittens was established at the main entrance of the exhibition hall of the museum in honor of the anniversary and as a sign of respect for the profession of metallurgist. [4]

REFERENCES

1. V. V. Kostochkin. Solikamsk. Usolye. Stroyizdat. ISBN 5-274-00186-61988.

2. Alferov N. S. Origin and development of domestic industrial architecture in the Urals: yew.... edging. Architecture / the Urals. S. M. Kirov. – Sverdlovsk: B., 1962. – 360 l.

3. A monument of industrial architecture of federal value (The Blast furnace with the foundry yard, 1860) – Electronic test data. – Access mode: http://semantic.uraic.ru/post/postbrowse.aspx?postid=1446&f=p&q=false&q2=false&index=true&plus=true&project=1

4. Seversky Tube Works. History. – Electronic text data. – Access mode: https://stz.tmk-group.ru/sever_history

5. Arch of historical and cultural monuments of Sverdlovsk region". T2. – "Socrates", 2008. – Page 597-598).

Life in a "Seashell"

Student Riabinina Ekaterina
Research superviser Bersteneva T.S.

Could one love the sea so much that they would live in a seashell? The answer is "Yes". That seems insane, but the deficit of the sense of closeness and unity with nature more and more necessitates people to realize their sometimes strange life ideas in architecture, be it a house in the form of animals, plants and even the human or its individual parts. Such interesting way of expression was named "organic architecture".

Organic architecture takes its springs from the end of the XIX and the beginning of the XX centuries. The basics of this art way were established by L. Sullivan, F.L Wright, A. Gaudi, R. Steiner, H. Haring and others. Some of the pioneers of the modern movement, such as F.L. Wright and R. Steiner, had already brought about this revival in the fifties and sixties. They transformed its initially rigid geometrical character into a livelier, organic direction. [1]

They explain it in losing contact between human, natural environment and society, dehumanization of human beings in deharmonization of industrialized urban environment.

Rudolf Steiner said: "The spiritual aspect of creating bionic forms associated with the attempt to understand the human mission. In accordance with it architecture is treated as a "place" which discloses the meaning of human existence". [1]

During the last decades of the twentieth century organic architecture experienced a vigorous revival. A new generation of architects inspired by the works of predecessors wed their ideas with local building traditions, new techniques
and their own creative impulses; they seek to realize the unusual design principles of "green" building. In this way, a new diversity of nonstandard